Flexible, wear-resistant coatings for carbonate], metal, etc. - by reaction of water with epoxy Gp.-contg. hydrolysable silane(s), esp. gamma-glycidyl-oxy-propyl-tri:methoxy-silane

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Inventor(s): ARPAC ERTUGRUL (DE); GLAUBITT WALTHER (DE); NASS RUEDIGER
Applicant(s): FRAUNHOFER GES FORSCHUNG (DE)
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Abstract

A process for the prodn. of paint (I), by reaction of hydrolysable silanes of formula R4Si (II) and/or corresp. oligomeric hydrolysis prods. thereof at not above 50 deg.C. with water in the mol. ratio water:(hydrolysable gps.) = (1:1)-(0.4:1); R = hydrolysable gps. (A), OH gps. or non-hydrolysable gps. (B); at least some of the (B) gps. contain an epoxide ring, and mol. ratio (A gps.):(epoxy gps.) = (6:1)-(0.5:1).
Also claimed are paints (I) as such.
Pref. (II) is a glycidyloxyalkyl- trialkoxysilane, esp. gamma-glycidyloxypropyl- trimethylsilane (IIA); mol. ratio (A gps.):(epoxy gps.) = (4.5:1)-(1.5:1), pref. (3.5:1)-(2.5:1), and mol. ratio (water):(B gps.) = (0.7:1)-(0.45:1), pref. (0.6:1)-(0.5:1); reaction is carried out in the presence of an acid or basic catalyst which causes no ring-opening under these conditions, pref. H.Hal (esp. HCl), carboxylic acid (esp. HCOOH or ACOH).
Also claimed is a process for coating substrates (esp. polycarbonate, poly(meth)acrylate, rubbery polymers, PET or metals, partic. Al or Cu), by applying (I) and hardening the coating by heat or irradiation (opt. with added catalyst).
% USE/ADVANTAGE - Provides an abrasion resistant coating material which is more flexible than prior- art polysiloxane-based coatings and is therefore suitable for coating flexible moulded prods., e.g. film; the coatings obtd. also have good adhesion and excellent optical properties, and are resistant to humidity and stress cracking.